## WHAT IS CLAIMED IS:

1. A racemate, diastereoisomer, or optical isomer of a compound of formula (I):

wherein  ${\bf B}$  is  $(C_{1-10})$ alkyl,  $(C_{3-7})$ cycloalkyl, or  $(C_{1-4})$ alkyl- $(C_{3-7})$ cycloalkyl,

- a) wherein said cycloalkyl and alkyl-cycloalkyl may be mono-, di- or trisubstituted with  $(C_{1-3})$ alkyl; and
- b) wherein said alkyl, cycloalkyl, and alkyl-cycloalkyl may be mono- or disubstituted with substituents selected from hydroxy and O-(C<sub>1-4</sub>)alkyl; and
- c) wherein each of said alkyl groups may be mono-, di- or tri-substituted by halogen; and
- d) wherein in each of said cycloalkyl groups being 5-, 6- or 7-membered, one or two -CH<sub>2</sub>-groups not being directly linked to each other may be replaced by -O- such that the O-atom is linked to the group X via at least two C-atoms;

## X is O or NH;

- R<sup>3</sup> is (C<sub>2-8</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl, or (C<sub>1-3</sub>)alkyl-(C<sub>3-7</sub>)cycloalkyl, wherein each of said alkyl and cycloalkyl groups may be mono-, di- or trisubstituted with (C<sub>1-4</sub>)alkyl;
- R<sup>21</sup> is H, halogen, -OH, (C<sub>1-6</sub>)alkyl, (C<sub>3-6</sub>)cycloalkyl, -(C<sub>1-4</sub>)alkyl- (C<sub>3-6</sub>)cycloalkyl, (C<sub>1-6</sub>)alkoxy, -O-(C<sub>3-6</sub>)cycloalkyl, -O-(C<sub>1-4</sub>)alkyl- (C<sub>3-6</sub>)cycloalkyl or -N( $\mathbb{R}^{24}$ )<sub>2</sub>, wherein each  $\mathbb{R}^{24}$  is independently: H, (C<sub>1-6</sub>)alkyl, -(C<sub>3-6</sub>)cycloalkyl, or -(C<sub>1-4</sub>)alkyl-(C<sub>3-6</sub>)cycloalkyl;

R<sup>22</sup> is -NR<sup>N2</sup>COOR<sup>0</sup> or -NR<sup>N2</sup>CONR<sup>N3</sup>R<sup>N1</sup>, wherein
R<sup>0</sup> is selected from (C<sub>1-8</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl, and (C<sub>1-4</sub>)alkyl(C<sub>3-7</sub>)cycloalkyl, wherein said cycloalkyl and alkyl-cycloalkyl may be mono-, di- or tri-substituted with (C<sub>1-3</sub>)alkyl;
R<sup>N1</sup> is H or R<sup>0</sup> as defined above; and
R<sup>N2</sup> and R<sup>N3</sup> are independently selected from H and methyl;

- R<sup>1</sup> is ethyl or vinyl;
- is hydroxy or NHSO<sub>2</sub>R<sup>s</sup> wherein R<sup>s</sup> is (C<sub>1-6</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl or (C<sub>1-6</sub>)alkyl-(C<sub>3-7</sub>)cycloalkyl, phenyl, naphthyl, pyridinyl, (C<sub>1-4</sub>)alkyl-phenyl, (C<sub>1-4</sub>)alkyl-naphthyl or (C<sub>1-4</sub>)alkyl-pyridinyl; each of which optionally being mono-, di- or tri-substituted with substituents selected from halogen, hydroxy, cyano, (C<sub>1-4</sub>)alkyl, O-(C<sub>1-6</sub>)alkyl, -CO-NH<sub>2</sub>, -CO-NH((C<sub>1-4</sub>)alkyl), -CO-N((C<sub>1-4</sub>)alkyl)<sub>2</sub>, -NH<sub>2</sub>, -NH((C<sub>1-4</sub>)alkyl), -N((C<sub>1-4</sub>)alkyl)<sub>2</sub>, wherein (C<sub>1-4</sub>)alkyl and O-(C<sub>1-6</sub>)alkyl are optionally mono-, di- or trisubstituted with halogen; and each of which optionally being monosubstituted with nitro;

or a pharmaceutically acceptable salt or ester thereof.

- 2. The compound according to claim 1, wherein
  - B is  $(C_{1-10})$ alkyl,  $(C_{3-7})$ cycloalkyl or  $(C_{1-4})$ alkyl- $(C_{3-7})$ cycloalkyl,
    - a) wherein said cycloalkyl and alkyl-cycloalkyl may be mono-, di- or trisubstituted with (C<sub>1-3</sub>)alkyl; and
    - b) wherein said alkyl, cycloalkyl and alkyl-cycloalkyl may be mono- or di-substituted with substituents selected from hydroxy and O-(C<sub>1-4</sub>)alkyl; and
    - c) wherein each of said alkyl-groups may be mono-, di- or trisubstituted by halogen; and
    - d) wherein in each of said cycloalkyl-groups being 5-, 6- or 7-membered, one or two -CH<sub>2</sub>-groups not being directly linked to each other may be replaced by -O- such that the O-atom is linked to the group **X** via at least two C-atoms;

- X is O or NH;
- R<sup>3</sup> is (C<sub>2-8</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl or (C<sub>1-3</sub>)alkyl-(C<sub>3-7</sub>)cycloalkyl, wherein said cycloalkyl groups may be mono-, di- or tri-substituted with (C<sub>1-4</sub>)alkyl;
- R<sup>21</sup> H, halogen, -OH, (C<sub>1-6</sub>)alkyl, (C<sub>3-6</sub>)cycloalkyl, -(C<sub>1-4</sub>)alkyl- (C<sub>3-6</sub>)cycloalkyl, (C<sub>1-6</sub>)alkoxy, -O-(C<sub>3-6</sub>)cycloalkyl, -O-(C<sub>1-4</sub>)alkyl- (C<sub>3-6</sub>)cycloalkyl or -N( $\mathbb{R}^{24}$ )<sub>2</sub>, wherein each  $\mathbb{R}^{24}$  is independently: H, (C<sub>1-6</sub>)alkyl, -(C<sub>3-6</sub>)cycloalkyl, or -(C<sub>1-4</sub>)alkyl-(C<sub>3-6</sub>)cycloalkyl;
- R<sup>22</sup> is -NR<sup>N2</sup>COOR<sup>0</sup> or -NR<sup>N2</sup>CONR<sup>N3</sup>R<sup>N1</sup>, wherein
  R<sup>0</sup> is selected from (C<sub>1-8</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl and (C<sub>1-4</sub>)alkyl(C<sub>3-7</sub>)cycloalkyl, wherein said cycloalkyl, alkyl-cycloalkyl may be mono-,
  di- or tri-substituted with (C<sub>1-3</sub>)alkyl;
  R<sup>N1</sup> is H or R<sup>0</sup> as defined above; and
  R<sup>N2</sup> and R<sup>N3</sup> are independently selected from H and methyl;
- R<sup>1</sup> is ethyl or vinyl;
- is hydroxy or NHSO<sub>2</sub>R<sup>s</sup> wherein R<sup>s</sup> is (C<sub>1-6</sub>)alkyl, (C<sub>3-7</sub>)cycloalkyl or (C<sub>1-6</sub>)alkyl-(C<sub>3-7</sub>)cycloalkyl, phenyl, naphthyl, pyridinyl, (C<sub>1-4</sub>)alkyl-phenyl, (C<sub>1-4</sub>)alkyl-naphthyl or (C<sub>1-4</sub>)alkyl-pyridinyl; all of which optionally being mono-, di- or tri-substituted with substituents selected from halogen, hydroxy, cyano, (C<sub>1-4</sub>)alkyl, O-(C<sub>1-6</sub>)alkyl, -CO-NH<sub>2</sub>, -CO-NH((C<sub>1-4</sub>)alkyl), -CO-N((C<sub>1-4</sub>)alkyl)<sub>2</sub>, -NH<sub>2</sub>, -NH((C<sub>1-4</sub>)alkyl), -N((C<sub>1-4</sub>)alkyl)<sub>2</sub>; and all of which optionally being monosubstituted with nitro;

or a pharmaceutically acceptable salt or ester thereof.

3. The compound according to claim 1, wherein  $R^{21}$  is selected from halogen, - OH,  $(C_{1:3})$ alkoxy or  $N(R^{24})_2$ , wherein each  $R^{24}$  is independently: H or  $(C_{1:4})$ alkyl.

- 4. The compound according to claim 3, wherein R<sup>21</sup> is selected from -OH, -OCH<sub>3</sub> and -N(CH<sub>3</sub>)<sub>2</sub>.
- The compound according to claim 1, wherein R<sup>22</sup> is
   NHCOOR<sup>0</sup> or NHCONHR<sup>N1</sup>, wherein R<sup>N1</sup> and R<sup>0</sup> are defined as in claim 1.
- 6. The compound according to claim 5, wherein R<sup>0</sup> and R<sup>N1</sup>, are selected from the group consisting of methyl, ethyl, propyl, 1-methylethyl, butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl and cyclohexylmethyl; wherein said cycloalkyl and alkyl-cycloalkyl groups optionally being substituted by 1 to 3 substituents selected from methyl and ethyl.
- 7. The compound according to claim 1, wherein **B** is selected from  $(C_{1-4})$ alkyl,  $(C_{3-7})$ cycloalkyl and  $(C_{1-3})$ alkyl- $(C_{3-7})$ cycloalkyl,
  - a) wherein said cycloalkyl and alkyl-cycloalkyl may be mono-, di- or trisubstituted with ( $C_{1-3}$ )alkyl; and
  - b) wherein said alkyl, cycloalkyl and alkyl-cycloalkyl may be mono- or disubstituted with substituents selected from hydroxy and O-(C<sub>1.4</sub>)alkyl; and
  - c) wherein each of said alkyl groups may be mono-, di- or tri-substituted with fluorine or mono-substituted by chlorine or bromine; and
  - d) wherein in each of said cycloalkyl groups being 5-, 6- or 7-membered, one or two -CH<sub>2</sub>-groups not being directly linked to each other may be replaced by -O- such that the O-atom is linked to the group **X** via at least two C-atoms.
- 8. The compound according to claim 7, wherein **B** is selected from ethyl, n-propyl, i-propyl, n-butyl, 1-methylpropyl, 2-methylpropyl, *tert*-butyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclopentyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl and cyclohexylmethyl,
  - a) wherein each of said cycloalkyl and alkyl-cycloalkyl groups optionally being substituted by 1 to 3 substituents selected from methyl and ethyl;
  - b) wherein each of said groups optionally being mono- or di-substituted with

- substituents selected from hydroxy, methoxy and ethoxy; and
- c) wherein each of said alkyl groups may be mono-, di- or tri-substituted with fluorine or mono-substituted by chlorine or bromine and
- d) wherein in each of said cycloalkyl-groups being 5-, 6- or 7-membered, one or two -CH<sub>2</sub>-groups not being directly linked to each other may be replaced by -O- such that the O-atom is linked to the group **X** via at least two C-atoms.
- The compound according to claim 8, wherein B is selected from cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, 1-methylcyclopentyl and 1methylcyclohexyl.
- 10. The compound according to claim 1, wherein R³ is selected from ethyl, propyl, butyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, each of which optionally being substituted by 1 to 3 substituents selected from methyl, ethyl and propyl.
- The compound according to claim 10, wherein R³ is selected from 1-methylethyl, 1,1-dimethylethyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylpropyl, 1,2-dimethylpropyl, 2,2-dimethylpropyl, cyclopentyl, cyclopentyl, cyclopentyl, 1-methylcyclopentyl, 1-methylcyclopentyl, cyclopentylmethyl, cyclohexylmethyl, (1-methylcyclopentyl)methyl and (1-methylcyclohexyl)methyl.
- 12. The compound according to claim 1, wherein R<sup>1</sup> is vinyl.
- 13. The compound according to claim 1, wherein R<sup>c</sup> is selected from hydroxy or NHSO<sub>2</sub>R<sup>s</sup> wherein R<sup>s</sup> is methyl, ethyl, n-propyl, i-propyl, n-butyl, 1-methylpropyl, 2-methylpropyl, tert-butyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cyclopropylmethyl, cyclobutylmethyl, cyclopentylmethyl, cyclohexylmethyl, phenyl, naphthyl, pyridinyl, phenylmethyl, naphthylmethyl or pyridinylmethyl,
  - a) each of which optionally being mono-, di- or tri-substituted with substituents

selected from fluorine and methyl; and

- b) each of which optionally being mono- or disubstituted with substituents selected from hydroxy, trifluoromethyl, methoxy and trifluoromethoxy; and
- c) each of which optionally being monosubstituted with substituents selected from chlorine, bromine, cyano, nitro, -CO-NH<sub>2</sub>, -CO-NHCH<sub>3</sub>, -CO-N(CH<sub>3</sub>)<sub>2</sub>, -NH<sub>2</sub>, -NH(CH<sub>3</sub>) and -N(CH<sub>3</sub>)<sub>2</sub>.
- 14. The compound according to claim 13 wherein R<sup>c</sup> is hydroxy, NHSO<sub>2</sub>-methyl, NHSO<sub>2</sub>-ethyl, NHSO<sub>2</sub>-(1-methyl)ethyl, NHSO<sub>2</sub>-propyl, NHSO<sub>2</sub>-cyclopropyl, NHSO<sub>2</sub>-cyclopropylmethyl, NHSO<sub>2</sub>-cyclobutyl, NHSO<sub>2</sub>-cyclopentyl or NHSO<sub>2</sub>-phenyl.
- 15. The compound according to claim 14 wherein the group **R**<sup>c</sup> is hydroxy.
- **16.** The compound according to claim 14 wherein the group R<sup>c</sup> is NHSO<sub>2</sub>-cyclopropyl.
- 17. The compound according to claim 1, wherein X is O.
- 18. The compound according to claim 1, wherein X is NH.
- 19. The compound according to claim 1, represented by formula:

wherein  $\mathbb{R}^{21}$  is  $-OCH_3$  or  $N(CH_3)_2$ ;

R<sup>22</sup> is -NHCOOR<sup>0</sup> or -NHCONHR<sup>N1</sup>, wherein

R<sup>0</sup> and R<sup>N1</sup> is each independently selected from (C<sub>1-4</sub>)alkyl or (C<sub>3-6</sub>)cycloalkyl;

- **B** is  $(C_{4-6})$ cycloalkyl;
- X is O or NH;
- R<sup>3</sup> is tert-butyl or cyclohexyl;
- $R^c$  is hydroxy or NHSO<sub>2</sub> $R^s$  wherein  $R^s$  is (C<sub>1-4</sub>)alkyl, (C<sub>3-6</sub>)cycloalkyl or

phenyl;

or a pharmaceutically acceptable salt or ester thereof.

- 20. The compound according to claim 19, wherein  $R^{21}$  is -OCH<sub>3</sub>;  $R^{22}$  is NHCOOR<sup>0</sup> wherein  $R^0$  is isopropyl or cyclopentyl; and  $R^c$  is NHSO<sub>2</sub> $R^s$  wherein  $R^s$  is cyclopropyl; and wherein  $R^s$ ,  $R^{22}$ , and  $R^s$  are defined as in claim 19.
- 21. The compound according to claim 19 wherein  $\mathbb{R}^{\mathbb{C}}$  is hydroxy and wherein  $\mathbb{B}$ ,  $\mathbb{X}$ ,  $\mathbb{R}^{21}$ ,  $\mathbb{R}^{22}$ , and  $\mathbb{R}^3$  are defined as in claim 19.
- 22. The compound according to claim 21 wherein R<sup>21</sup> is -OCH<sub>3</sub> and R<sup>22</sup> is NHCOOR<sup>0</sup> wherein R<sup>0</sup> is isopropyl or cyclopentyl, and wherein B, X, R<sup>c</sup>, and R<sup>3</sup> are defined as in claim 21.
- 23. The compound according to claim 1 of the formula

wherein the substituents B,  $R^3$ ,  $R^{21}$ ,  $R^{22}$  and  $R^c$  are defined according to the following table

Cpd	В	R³	R <sup>21</sup>	. R <sup>22</sup>	R <sup>C</sup>
101	5	4	-OCH₃	√N° ~ ✓	-ОН
102	5	<u>+</u>	-OCH₃	× N O	· -OH

Cpd	В	R <sup>3</sup>	R <sup>21</sup>	R <sup>22</sup>	R <sup>c</sup>
103	5	<del>Y</del>	-OCH₃	√ <sub>H</sub> <sup>Δ</sup> <sub>H</sub> ∕	-ОН
104		<u>Y</u>	-OCH₃	∠ <sub>N</sub> L <sub>o</sub> ∠>	-OH
105	5	<u>\</u>	-OCH₃	Kn No L	-ОН
106	Ţ.	<u>Y</u> .	-OCH₃	in the second se	-ОН
<sup>.</sup> 107	T.	<del>Y</del>	-OCH₃	~ <sub>H</sub> → .	-OH
108	J	1	-OCH₃	~HO_	-OH
109	5		-OCH₃	~ Hot	-ОН
110	J		-OCH₃	- Hold	-ОН
111	J	1	-OCH₃	~ <sub>N</sub> L <sub>o</sub> C	-ОН
112			-OCH₃	~ Lo	-он

Cpd	В	R <sup>3</sup>	R <sup>21</sup>	R <sup>22</sup>	R <sup>c</sup>
113	5	$\bigcirc$	-OCH₃	∠ <sub>N</sub> L <sub>o</sub> ∠>	-ОН
114			-OCH₃	∠ <sub>N</sub> L <sub>o</sub> √	-OH
115	\( \frac{1}{\chi} \)	<u>Y</u>	N(CH <sub>3</sub> ) <sub>2</sub>	~ <sub>N</sub> Å <sub>o</sub> ∠	-OH
116	5	<del>Y.</del>	N(CH <sub>3</sub> ) <sub>2</sub>	KN O	-ОН
117	T	<del>\</del>	N(CH <sub>3</sub> ) <sub>2</sub>	~ Hot	-OH
118	Ŭ,	$\bigcirc$	N(CH <sub>3</sub> ) <sub>2</sub>	~ H o L	-OH
119	5		N(CH <sub>3</sub> ) <sub>2</sub>	~NO.	-OH
120			N(CH <sub>3</sub> ) <sub>2</sub>	~ Hod	-OH
121	Ţ	1	N(CH <sub>3</sub> ) <sub>2</sub>	~ Lo	-ОН
122	5	<u>+</u>	N(CH <sub>3</sub> ) <sub>2</sub>	∠ <sub>N</sub> L <sub>o</sub> √	-ОН

Cpd	В	R <sup>3</sup>	R <sup>21</sup>	R <sup>22</sup>	R <sup>c</sup>
123		<u>\</u>	N(CH₃)₂	~ <sub>N</sub> L <sub>o</sub> √	-OH
124	\( \frac{1}{2} \)		N(CH₃)₂	i, i, c	-ОН
125	5	$\bigcirc$	N(CH <sub>3</sub> ) <sub>2</sub>	∴ <sub>N</sub> L <sub>o</sub> √	-OH
126			N(CH <sub>3</sub> ) <sub>2</sub>	~ Ho√	-OH
127	7	¥.	N(CH <sub>3</sub> ) <sub>2</sub>	i, lo√	-OH

## 24. The compound according to claim 1 of the formula

wherein the substituents B,  $R^3$ ,  $R^{21}$ ,  $R^{22}$  and  $R^C$  are defined according to the following table

Cpd	В	R <sup>3</sup>	R <sup>21</sup>	R <sup>22</sup>	R <sup>c</sup>
201	5	<u>Y</u>	-OCH₃	∴NT o →	-OH

Cpd	В	R³	R <sup>21</sup>	R <sup>22</sup>	R <sup>c</sup>
202		<u>Y</u> .	-OCH₃	∴ <sub>N</sub> C.	-ОН
203	5	<u>Y</u>	-N(CH <sub>3</sub> ) <sub>2</sub>	~ Lo	-OH

- 25. A pharmaceutical composition comprising an anti-hepatitis C virally effective amount of a compound of formula I according to claim 1 or a pharmaceutically acceptable salt or ester thereof, in admixture with at least one pharmaceutically acceptable carrier medium or auxiliary agent.
- 26. The pharmaceutical composition according to claim 25 further comprising a therapeutically effective amount of at least one other antiviral agent.
- 27. The pharmaceutical composition according to claim 26, wherein said other antiviral agent is ribavirin.
- 28. The pharmaceutical composition according to claim 26, wherein said other antiviral agent is selected from another anti-HCV agent, HIV inhibitor, HAV inhibitor and HBV inhibitor.
- 29. The pharmaceutical composition according to claim 28 wherein said other anti-HCV agent is selected from immunomodulatory agents, other inhibitors of HCV NS3 protease, inhibitors of HCV polymerase and inhibitors of another target in the HCV life cycle.
- 30. The pharmaceutical composition according to claim 29 wherein said immunomodulatory agent is selected from  $\alpha$ -interferon and pegylated  $\alpha$ -interferon.
- 31. The pharmaceutical composition according to claim 29, wherein said inhibitor of another target in the HCV life cycle is selected from inhibitors of: helicase,

- NS2/3 protease and internal ribosome entry site (IRES).
- 32. A method for the treatment or prevention of a hepatitis C viral infection in a mammal by administering to the mammal an anti-hepatitis C virally effective amount of a compound of formula I according to claim 1, or a pharmaceutically acceptable salt or ester thereof.
- 33. A method for the treatment or prevention of a hepatitis C viral infection in a mammal by administering thereto an anti-hepatitis C virally effective amount of a compound of formula I according to claim 1, or a pharmaceutically acceptable salt or ester thereof, in combination with at least one other antiviral agent.
- 34. The method according to claim 33, wherein said antiviral agent is ribavirin.
- **35.** The method according to claim 33, wherein said other antiviral agent is selected from another anti-HCV agent, HIV inhibitor, HAV inhibitor and HBV inhibitor.
- 36. The method according to claim 35, wherein said other anti-HCV agent is selected from immunomodulatory agents, other inhibitors of HCV NS3 protease, inhibitors of HCV polymerase and inhibitors of another target in the HCV life cycle.
- 37. The method according to claim 36, wherein said immunomodulatory agent is selected from  $\alpha$ -interferon and pegylated  $\alpha$ -interferon.
- 38. The method according to claim 36, wherein said inhibitor of another target in the HCV life cycle is selected from inhibitors of: helicase, NS2/3 protease and internal ribosome entry site (IRES).